

What is claimed is:

1. A polymeric composition comprising the reaction product of an A polymer which is an addition polymer having 3.5 or more reactive functional groups per polymer chain and a B polymer having about 2 to about 3 functional groups per polymer chain that are co-reactive with said reactive functional groups of the A polymer, wherein substantially all of the co-reactive functional groups of the B polymer have been co-reacted and a molar ratio of A polymer to B polymer is about 3:1 to about 2:1.7, said polymeric composition being essentially non-gelled.
2. A polymeric composition according to claim 1, wherein the B polymer has about 2 functional groups per polymer chain and the molar ratio of A polymer to B polymer is about 2:1 to about 2:1.7.
3. A polymeric composition according to claim 1, wherein the B polymer has about 3 functional groups per polymer chain and the molar ratio of A polymer to B polymer is about 3:1.
4. A polymeric composition according to any one of claims 2 or 3, wherein said reactive functional group of the A polymer is a condensation-reactive functional group selected from the group consisting of carboxyl, hydroxyl, epoxy, isocyanato, carboxyl anhydride, sulfo, esterified oxycarbonyl, amino or mixtures thereof.
5. A polymeric composition according to any one of claims 2 or 3, wherein said B polymer is a condensation polymer selected from the group consisting of polyamide, polyester, epoxy, polyurethane, polyorganosiloxane and poly(ether).
6. A polymeric composition according to claim 5, wherein said co-reactive functional groups of said B polymer are hydroxyl, carboxyl, epoxy, oxazolinyl, ester, amino, isocyanato or mixtures thereof.
7. A polymeric composition according to claim 6, wherein said A polymer has 3.5 or more carboxyl functional groups per polymer chain.

8. A polymeric composition according to claim 7, wherein said A polymer is a styrene/acrylic acid/ α -methyl-styrene polymer having a Mn in a range from about 500 to about 50,000.

9. A polymeric composition according to claim 6, wherein said A polymer has 3.5 or more hydroxyl functional groups per polymer chain.

10. A polymeric composition according to claim 9, wherein said A polymer is a styrene/2-ethylhexyl acrylate/2-hydroxyethyl methacrylate polymer having a Mn in a range from about 500 to about 50,000.

11. A process for preparing a polymeric composition, said process comprising the step of reacting an A polymer which is an addition polymer having 3.5 or more reactive functional groups per polymer chain with a B polymer having about 2 to about 3 functional groups per polymer chain that are co-reactive with the reactive functional groups of the A polymer at a temperature and for a time sufficient to form the substantially non-gelled polymeric composition, wherein substantially all of the co-reactive functional groups of the B polymer have been co-reacted and a molar ratio of A polymer to B polymer is about 3:1 to about 2:1.7, said polymeric composition being substantially non-gelled.

12. A process according to claim 11, wherein the B polymer has about 2 functional groups per polymer chain and the molar ratio of A polymer to B polymer is about 2:1 to about 2:1.7

13. A process according to claim 11, wherein the B polymer has about 3 functional groups per polymer chain and the molar ratio of A polymer to B polymer is about 3:1.

14. A process according to any one of claims 12 or 13, wherein said temperature is between about -50° C to about 300° C.

15. A process according to claim 14, wherein said reactive functional group of the A polymer is a condensation-reactive functional group selected from the group consisting of carboxyl, hydroxyl, epoxy, isocyanato, carboxyl anhydride, sulfo, esterified oxycarboxyl, amino or mixtures thereof.

16. A process according to claim 15, wherein said B polymer is a condensation polymer selected from the group consisting of polyamide, polyester, epoxy, polyurethane, silicone and poly(ether).

17. A process according to claim 16, wherein said co-reactive functional groups of said B polymer are hydroxyl, carboxyl, epoxy, oxazolinyl, ester, amino, isocyanato or mixtures thereof.

18. A process according to claim 17, wherein said A polymer has 3.5 or more carboxyl functional groups per polymer chain.

19. A process according to claim 18, wherein said A polymer is a styrene/acrylic acid/ α -methylstyrene polymer having an Mn in a range of about 500 to about 50,000.

20. A process according to claim 17, wherein said A polymer has 3.5 or more hydroxyl functional groups per polymer chain.

21. A process according to claim 20, wherein said A polymer is a styrene/2-ethyl hexyl acrylate/2-hydroxyl ethyl methacrylate polymer having a Mn in a range from about 500 to about 50,000.

22. A powder coating composition comprising: (i) a substantially non-gelled polymeric composition that is the reaction product of an A polymer which is an addition polymer having 3.5 or more reactive functional groups per polymer chain and a B polymer having about 2 to about 3 functional groups per polymer chain that are co-reactive with said reactive functional groups of the A polymer; (ii) optionally a cross-linking agent; (iii) optionally a colorant; and (iv) optionally an epoxy resin, wherein substantially all of the co-reactive functional groups of the B polymer have been co-reacted and a molar ratio of A polymer to B polymer is about 3:1 to about 2:1.7.

23. A powder coating composition according to claim 22, wherein the B polymer has about 2 functional groups per polymer chain and the molar ratio of A polymer to B polymer is about 2:1 to about 2:1.7.

24. A powder coating composition according to claim 22, wherein the B polymer has about 3 functional groups per polymer chain and the molar ratio of A polymer to B polymer is about 3:1.

25. A powder coating composition according to any one of claims 23 or 24, wherein said reactive functional group of the A polymer is a condensation-reactive functional group selected from the group consisting of carboxyl, hydroxyl, epoxy, isocyanato, carboxyl anhydride, sulfo, esterified oxycarbonyl, amino or mixtures thereof.

26. A powder coating composition according to any one of claims 23 or 24, wherein said B polymer is a condensation polymer selected from the group consisting of polyamide, polyester, epoxy, polyurethane, polyorganosiloxane and poly(ether).

27. A powder coating composition according to claim 26, wherein said co-reactive functional groups of said B polymer are hydroxyl, carboxyl, epoxy, oxazolinyl, ester, amino, isocyanato or mixtures thereof.

28. A powder coating composition according to claim 27, wherein said A polymer has 3.5 or more carboxyl functional groups per polymer chain.

29. A powder coating composition according to claim 28, wherein said A polymer is a styrene/acrylic acid/ α -methyl-styrene polymer having a Mn in a range from about 500 to about 50,000.

30. A powder coating composition according to claim 27, wherein said A polymer has 3.5 or more hydroxyl functional groups per polymer chain.

31. A powder coating composition according to claim 30, wherein said A polymer is a styrene/2-ethylhexyl acrylate/2-hydroxyethyl methacrylate polymer having a Mn in a range from about 500 to about 50,000.

32. A 100% solids resin ink composition comprising: (i) a substantially non-gelled polymeric composition that is the reaction product of an A polymer which is an addition polymer having 3.5 or more reactive functional groups per polymer chain and a B polymer having about 2 to about 3 functional groups per polymer chain that are co-reactive with said reactive functional groups of the A polymer; and (ii) a colorant, wherein substantially all of the co-reactive functional groups of the B polymer have been co-reacted and a molar ratio of A polymer to B polymer is about 3:1 to about 2:1.7.

33. A 100% solids resin ink composition according to claim 32, wherein the B polymer has about 2 functional groups per polymer chain and the molar ratio of A polymer to B polymer is about 2:1 to about 2:1.7.

34. A 100% solids resin ink composition according to claim 32, wherein the B polymer has about 3 functional groups per polymer chain and the molar ratio of A polymer to B polymer is about 3:1.

35. A 100% solids resin ink composition according to any one of claims 33 or 34, wherein said reactive functional group of the A polymer is a condensation-reactive functional group selected from the group consisting of carboxyl, hydroxyl, epoxy, isocyanato, carboxyl anhydride, sulfo, esterified oxycarbonyl, amino or mixtures thereof.

36. A 100% solids resin ink composition according to any one of claims 33 or 34, wherein said B polymer is a condensation polymer selected from the group consisting of polyamide, polyester, epoxy, polyurethane, polyorganosiloxane and poly(ether).

37. A 100% solids resin ink composition according to claim 36, wherein said co-reactive functional groups of said B polymer are hydroxyl, carboxyl, epoxy, oxazolinyl, ester, amino, isocyanato or mixtures thereof.

38. A 100% solids resin ink composition according to claim 37, wherein said A polymer has 3.5 or more carboxyl functional groups per polymer chain.

39. A 100% solids resin ink composition according to claim 38, wherein said A polymer is a styrene/acrylic acid/ α -methyl-styrene polymer having a Mn in a range from about 500 to about 50,000.

40. A 100% solids resin ink composition according to claim 37, wherein said A polymer has 3.5 or more hydroxyl functional groups per polymer chain.

41. A 100% solids resin ink composition according to claim 40, wherein said A polymer is a styrene/2-ethylhexyl acrylate/2-hydroxyethyl methacrylate polymer having a Mn in a range from about 500 to about 50,000.

42. A method of preparing a reduced gloss acrylic epoxy hybrid powder coating comprising the step of mixing (a) a polymeric composition comprising a substantially non-gelled polymeric composition that is the reaction product of an A polymer which is an addition polymer having 3.5 or more reactive functional groups per polymer chain and a B polymer having about 2 to about 3 functional groups per polymer chain that are co-reactive with said reactive functional groups of the A polymer; (ii) an epoxy resin and (iii) an acrylic resin, wherein substantially all of the co-reactive functional groups of the B polymer have been co-reacted and a molar ratio of A polymer to B polymer is about 3:1 to about 2:1.7.

43. A method according to claim 42, wherein the B polymer has about 2 functional groups per polymer chain and the molar ratio of A polymer to B polymer is about 2:1 to about 2:1.7.

44. A method according to claim 42, wherein the B polymer has about 3 functional groups per polymer chain and the molar ratio of A polymer to B polymer is about 3:1.

45. A method according to any one of claims 43 or 44, wherein said reactive functional group of the A polymer is a condensation-reactive functional group selected from the group consisting of carboxyl, hydroxyl, epoxy, isocyanato, carboxyl anhydride, sulfo, esterified oxycarbonyl, amino or mixtures thereof.

46. A method according to any one of claims 43 or 44 wherein said B polymer is a condensation polymer selected from the group consisting of polyamide, polyester, epoxy, polyurethane, polyorganosiloxane and poly(ether).

47. A method according to claim 46, wherein said co-reactive functional groups of said B polymer are hydroxyl, carboxyl, epoxy, oxazolinyl, ester, amino, isocyanato or mixtures thereof.

48. A method according to claim 47, wherein said A polymer has 3.5 or more carboxyl functional groups per polymer chain.

49. A method according to claim 48, wherein said A polymer is a styrene/acrylic acid/α-methyl-styrene polymer having an Mn in a range from about 500 to about 50,000.

50. A method according to claim 47, wherein said A polymer has 3,5 or more hydroxyl functional groups per polymer chain.

51. A method according to claim 50, wherein said A polymer is a styrene/2-ethylhexyl acrylate/2-hydroxyethyl methacrylate polymer having a Mn in a range from about 500 to about 50,000.